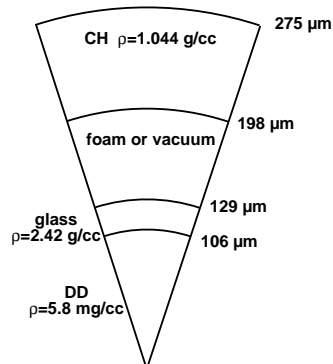
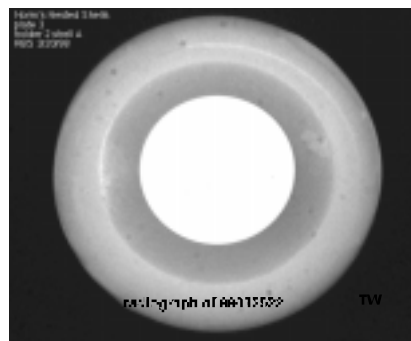


Double Shell Nova Implosions

Four scale-1 Nova hohlraum shots with 1 ns square, 20 kJ drive investigated the behavior of double shell capsules similar to those currently being



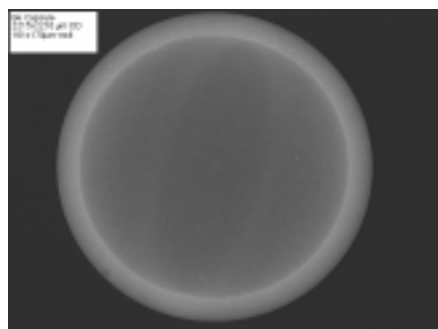
investigated as non-cryogenic NIF ignition targets. Two targets had low-density foam between the shells and two targets had vacuum. Based on earlier data from the Shiva laser, anticipated yield was expected to be approximately 1% of clean 1D. The actual production ranged from 1-2%, and was extremely reproducible regardless of manufacturing technique. The data are currently interpreted as meaning that the inherent $m = 5$



asymmetry at Nova may be controlling the behavior of these targets, at convergence ratio of 38 (initial outer radius to final fuel radius), in a manner similar to the behavior of single shell targets at similar convergence. Further shots will be taken in a spherical hohlraum at Omega with much better drive symmetry. If it

can be shown that the targets perform at least as well as single shells at high convergence, then the possibility of using the double shell design on NIF to reach ignition without frozen DT provides an attractive alternate path to one major goal of the program.

Fabrication



Los Alamos target fabrication has produced a prototype beryllium NIF capsule. With a radius of 1.1 mm and a wall of 0.16 mm, the capsule was fabricated by diffusion bonding hemispherical cavities and subsequently machining the outside diameter. A preliminary polish of the exterior was conducted after machining. The shell contains no fill gas.

Characterization by resonant ultrasound spectroscopy has indicated an excellent bond, while radiography and atomic force microscope (AFM) traces (by General Atomics) show some room for improvement in the shell geometry. The ultimate plan for this shell includes a pressure test to failure to determine the bond strength.

ICF/SBSS

A highly successful first phase of an investigation of filamentation was completed on the Trident laser system. This work involves the use of a nearly diffraction limited laser beams to simulate the effects of a single laser hot spot. A large array of diagnostic measurements were performed including gated observation of beam transmission, Thomson scattering and other optical scattering measurements.

Initial planning meetings were held with faculty from the University of Nevada (Reno and Las Vegas campuses) to plan experiments of joint interest that could be sponsored under the new DOE program supporting UN. Numerous areas of common interest (such as spectroscopic analysis of dense plasmas and special x-ray diagnostics) were identified and follow-on meetings will be held soon.